CLAIMS

We claim:

1. A targeting construct comprising:

(a) a first polynucleotide sequence homologous to a target gene, wherein the target gene is a melanocyte stimulating hormone receptor gene;

(c) a second polynucleotide sequence homologous to the target gene; and

(d) a selectable marker.

2. The targeting construct of claim 1, wherein the targeting construct further comprises a screening marker.

3. A method of producing a targeting construct, the method comprising:

(a) obtaining a first polynucleotide sequence homologous to a melanocyte stimulating hormone receptor gene;

(b) obtaining a second polynucleotide sequence homologous to a melanocyte stimulating hormone receptor gene;

(c) providing a vector comprising a selectable marker; and

(d) inserting the first and second sequences into the vector, to produce the targeting construct.

4. A method of producing a targeting construct, the method comprising:

(a) providing a polynucleotide sequence homologous to a melanocyte stimulating hormone receptor;

(b) generating two different fragments of the polynucleotide sequence;

(c) providing a vector having a gene encoding a selectable marker; and

(d) inserting the two different fragments into the vector to form the targeting construct.

5. A cell comprising a disruption in a melanocyte stimulating hormone receptor.

6. The cell of claim 5, wherein the cell is a murine cell.

7. The cell of claim 6, wherein the murine cell is an embryonic stem cell.

8. A non-human transgenic animal comprising a disruption in a melanocyte stimulating hormone receptor.

9. A cell derived from the non-human transgenic animal of claim 8.

10. A method of producing a transgenic mouse comprising a disruption in a melanocyte stimulating hormone receptor gene, the method comprising:

(a) introducing the targeting construct of claim 1 into a cell;

(b) introducing the cell into a blastocyst;

(c) implanting the resulting blastocyst into a pseudopregnant mouse, wherein said pseudopregnant mouse gives birth to a chimeric mouse; and

(d) breeding the chimeric mouse to produce the transgenic mouse.

11. A method of identifying an agent that modulates the expression of a melanocyte stimulating hormone receptor, the method comprising:

(a) providing a non-human transgenic animal comprising a disruption in a melanocyte stimulating hormone receptor gene;

(b) administering an agent to the non-human transgenic animal; and

(c) determining whether the expression of melanocyte stimulating hormone receptor in the non-human transgenic animal is modulated.

12. A method of identifying an agent that modulates the function of a melanocyte stimulating hormone receptor, the method comprising:

(a) providing a non-human transgenic animal comprising a disruption in a melanocyte stimulating hormone receptor gene;

(b) administering an agent to the non-human transgenic animal; and

(c) determining whether the function of the disrupted melanocyte stimulating hormone receptor gene in the non-human transgenic animal is modulated.

13. A method of identifying an agent that modulates the expression of melanocyte stimulating hormone receptor, the method comprising:

(a) providing a cell comprising a disruption in a melanocyte stimulating hormone receptor gene;

(b) contacting the cell with an agent; and

(c) determining whether expression of the melanocyte stimulating hormone receptor is modulated.

14. A method of identifying an agent that modulates the function of a melanocyte stimulating hormone receptor gene, the method comprising:

(a) providing a cell comprising a disruption in a melanocyte stimulating hormone receptor gene;

(b) contacting the cell with an agent; and

(c) determining whether the function of the melanocyte stimulating hormone receptor gene is modulated.

15. The method of claim 13 or claim 14, wherein the cell is derived from the non-human transgenic animal of claim 8.

16. An agent identified by the method of claim 11, claim 12, claim 13, or claim 14.

17. A transgenic mouse comprising a disruption in a melanocyte stimulating hormone receptor gene, wherein the transgenic mouse exhibits hypoactive behavior.

18. The transgenic mouse of claim 17, wherein the transgenic mouse is heterozygous for a disruption in a melanocyte stimulating hormone receptor gene.

19. The transgenic mouse of claim 17, wherein the transgenic mouse is homozygous for a disruption in a melanocyte stimulating hormone receptor gene.

20. A method of producing a transgenic mouse comprising a disruption in a melanocyte stimulating hormone receptor gene, wherein the transgenic mouse exhibits hypoactive behavior, the method comprising:

(a) introducing melanocyte stimulating hormone receptor gene targeting construct into a cell;

(b) introducing the cell into a blastocyst;

(c) implanting the resulting blastocyst into a pseudopregnant mouse, wherein said pseudopregnant mouse gives birth to a chimeric mouse; and

(d) breeding the chimeric mouse to produce the transgenic mouse comprising a disruption in a retina-specific nuclear receptor gene.

21. A cell derived from the transgenic mouse of claim 17 or claim 20, wherein the cell comprises a disruption in a melanocyte stimulating hormone receptor gene.

22. A method of identifying an agent that ameliorates hypoactive behavior, the method comprising:

(a) administering an agent to a transgenic mouse comprising a disruption in a melanocyte stimulating hormone receptor gene; and

(b) determining whether the agent ameliorates hypoactive behavior of the transgenic mouse.

23. A method of identifying an agent which modulates melanocyte stimulating hormone receptor gene expression, the method comprising:

(a) administering an agent to the transgenic mouse comprising a disruption in a melanocyte stimulating hormone receptor gene; and

(b) determining whether the agent modulates melanocyte stimulating hormone receptor gene expression in the transgenic mouse, wherein the agent has an effect on hypoactive behavior of the transgenic mouse.

24. A method of identifying an agent which modulates hypoactive behavior associated with a disruption in a melanocyte stimulating hormone receptor gene, the method comprising:

(a) administering an agent to a transgenic mouse comprising a disruption in a melanocyte stimulating hormone receptor gene; and

(b) determining whether the agent modulates hypoactive behavior of the transgenic mouse.

25. An agent identified by the method of claim 22, claim 23 or claim 24.